

## **5. REMEDIAL ACTION WORK PLAN**

### **5.1 Relevant Changes to the RD/RA SOW**

The RD/RA SOW for WAG 3, OU 3-13 (DOE-ID 2000a) presents a SOW for Group 5 that consists of

- Reevaluation of the SRPA model in order to identify the potential hot spot(s) for the COCs
- The drilling of four new wells/boreholes within the areas of the identified COC concentration
- The sampling and analysis of water samples from those wells
- Depending upon the results of the sampling, conducting 24-hour-pump tests on the wells where the COCs exceed proscribed action levels
- If the pump test(s) indicates that well production is equal to or greater than 0.5 gpm during the 24-hour test period, treatability studies will be performed.

Based on the modeling evaluation, the new wells/boreholes will be constructed to the HI interbed.

### **5.2 Subcontracting Plan**

The work elements comprising this RA consist primarily of well drilling and the monitoring, sampling, and analysis of the wells.

The major portion of this work is planned to be competitively bid and awarded to the lowest qualified bidder. The BBWI procurement process will be followed and will include, but is not limited to, issuance of a Request for Proposal (RFP), prebid conference, bid evaluation, notice of award, notice to proceed, vendor data submittals, and preconstruction kick-off meeting.

The work elements described in this work plan may be performed under a single subcontract or several subcontracts. Site force personnel may perform a portion of this work, if necessary. Both subcontract and site personnel will be required to perform to the schedule outlined in Section 5.7 of this document in order to meet the overall project schedule and objectives.

### **5.3 Remedial Action Work Elements**

This section provides an overview of the 10 major elements of the remedial action work plan.

#### **5.3.1 Premobilization**

Premobilization efforts involve all work elements that must be completed before the drilling contractor arrives on the site to start work. This includes such work as securing a contract for drilling services, surveying proposed locations, marking proposed locations for underground utilities, and completion and approval of work control packages. The final premobilization effort is a formal pre-job meeting at which the scope of work is discussed and Health and Safety Plan (HASP) training is conducted. Any outstanding questions about the work to be performed are resolved at this meeting.

### **5.3.2 Mobilization**

Once the pre-job meeting has been completed, the drilling contractor will be free to begin mobilization of the equipment to the site. Mobilization of equipment consists of physically locating all drilling and ancillary equipment to the site and setting up on the first hole to be drilled.

### **5.3.3 HI Interbed Hot Spot Drilling**

The BBWI procurement process will be followed and will include, but may not be limited to, the issuance of an RFP, prebid conference, bid evaluation, notice of award, notice to proceed, vendor data submittals, and preconstruction kick-off meeting.

A trained geologist, supported by the area construction engineer, will observe the well drilling activities to log the borehole and well construction and ensure that the work meets the contract requirements.

Other work elements included in this task, such as nondrilling fieldwork, may be performed by BBWI personnel or performed under other subcontracts.

### **5.3.4 Vertical Sampling**

Borehole geophysical and fluid logging will be performed by BBWI or USGS personnel.

Collection of interbed materials and aquifer water samples will be conducted by INEEL personnel. A subcontract laboratory will perform analysis of the samples. Coordination of the laboratory contracting and data management (as shown in Appendix D, Data Management Plan) will be performed by the INEEL Sample Management Organization (SMO).

### **5.3.5 24-Hour Pumping and Sampling**

If needed, any 24-hour-pumping tests and any other sampling or work elements included in this task, may be performed by BBWI personnel or performed under other subcontracts. A subcontract laboratory will perform analysis of the samples collected during the pump test. Coordination of the laboratory contracting and data management will be performed by the INEEL SMO.

### **5.3.6 Demobilization**

When all drilling has been completed and instrumentation has been placed, the contractor will begin demobilization of the equipment. Demobilization includes the physical removal of all equipment from the site, restoration of disturbed areas, and general cleanup of all work areas. When demobilization is completed, the work areas should be as close to original condition as possible.

### **5.3.7 Baseline Sampling**

Forty-seven existing INTEC aquifer wells will be sampled by INEEL personnel at the onset of the Group 5 monitoring. The choice of a laboratory to perform the sample analysis has yet to be made. Coordination of the laboratory contracting and data management will be performed by the INEEL SMO.

### **5.3.8 Micropurge Sampling**

During the semiannual groundwater sampling event, groundwater samples will be collected using both the high flow (15 – 25 gpm) pumps currently in the wells and using a micropurge method that pumps approximately 1 gpm at approximately 20 wells. The data from both methods will be evaluated to determine if the data sets are statistically equivalent. If the micropurge data are determined to be equivalent to the standard method data, subsequent groundwater samples will be collected by the

micropurge method. Adopting the micropurge method will substantially reduce the amount of wastewater generated during sampling and significantly reduce the costs associated with the monitoring program.

#### **5.3.9 INTEC Facility Monitoring**

Eleven existing INTEC aquifer wells will be sampled by INEEL personnel to evaluate if the RAOs will be met. In addition, three wells will be sampled below the HI interbed to evaluate the former INTEC injection well. The choice of a laboratory to perform the sample analysis has yet to be made. Coordination of the laboratory contracting and data management will be performed by the INEEL SMO.

#### **5.3.10 Long-Term Monitoring of the Plume Outside the INTEC Fence**

Six wells have been selected for long-term monitoring of the INTEC plume beyond the INTEC security fence. The location and number of wells used for long-term monitoring are contingent upon the results of the baseline groundwater sampling and the plume evaluation results (that is, the contamination within, or below, the HI interbed). The choice of a laboratory to perform the sample analysis has not yet been made. Coordination of the laboratory contracting and data management will be performed by the INEEL SMO.

### **5.4 Evaluation of Remedial Action Against Performance Measurement Points**

Under Group 5, there are two potential sources of contamination that may prevent meeting the SRPA RAOs. The first source is a model-predicted hot spot of I-129, Sr-90, and H-3 that may exist in the HI sedimentary interbed south of INTEC. This predicted hot spot resides within the current boundary of Group 5. The potential existence of this hot spot is the driver for the Plume Evaluation FSP (see Appendix A) presented as part of this MSIP. The second potential source of contamination to Group 5 that may prevent meeting the SRPA RAOs is the flux of contaminants into Group 5 from vadose zone and aquifer contamination present inside the INTEC security fences. The Group 4 remedial actions and OU 3-14 RI/FS are designed to address remediation of this contamination. However, the flux of contaminants migrating from beneath the INTEC facility and the long-term monitoring of the INTEC groundwater plume outside of the INTEC fence are the drivers for the Group 5 LTMP included in this MSIP.

Both of these potential sources of contamination, and the monitoring/remedial actions performed to address them, will be evaluated against the same RAO of preventing COC concentrations from exceeding MCLs in 2095, though the method of evaluation is different between the two sources of contamination.

#### **5.4.1 Evaluation of HI Interbed Testing**

The results of the HI interbed testing will be evaluated using the evaluation steps that have been generally defined in the ROD (DOE-ID 1999, Figure 11-6, pages 11-27) and the project flow chart (Figure 2-1 in this report). This evaluation consists of first determining whether there exist zones of groundwater contamination within the model-predicted hot spot, where COC concentrations exceed an action level above which the COC concentration is predicted to continue to exceed MCLs in 2095 and beyond. If no zones exceeding this action level are identified, then the plume evaluation is completed and no risk is assumed to exist from this potential source of contamination.

If a zone(s) is found that exceeds the COC action level, then additional testing in the form of a 24-hour-pump test and sampling will be performed to evaluate whether the zone exceeding the action level has a potential groundwater production capacity to supply a hypothetical residential groundwater user. Again, if the production capacity of the zone(s) is not sufficient to meet the residential user

minimum requirement of 0.5 gpm for 24-hour plume evaluation is completed and no risk is assumed to exist from this potential source of contamination.

Finally, if the contaminated zone(s) exceeding COC action levels is capable of producing at least 0.5 gpm for 24 hours, then the volume of this hot spot will be assessed through the creation of isopleth maps. The volume of the hot spot will be evaluated either through numerical modeling or analytical methods to determine if the hypothetical groundwater user could pump from the hot spot for at least one year. If the hot spot is determined to be too small in volume to sustain the groundwater user for one year, then the plume evaluation is completed and no risk, or an acceptable risk, is assumed to exist from this potential source of contamination. If the zone is sufficient to sustain the groundwater user for more than one year, contingent remedial actions are required. The project will proceed as shown in the project flow path on Figure 2-1.

#### **5.4.2 Evaluation of Long-Term Monitoring Results**

The data obtained under the LTMP will be evaluated and incorporated into a refined WAG 3 numerical model to determine the flux of contaminants to the SRPA outside the INTEC security fence and to determine if WAG 3 RA will result in meeting the COC concentration limits at the INTEC security fence in 2095. As discussed above, this numerical modeling task will incorporate the results of the long-term monitoring results, as well as data from other sources including the Group 4 monitoring activities, OU 3-14 tank farm RI/FS results, and other sources that may become available. This combined evaluation will be performed for both Groups 4 and 5, which share a common RAO of preventing COC concentrations in the SRPA from exceeding MCLs in 2095 and beyond, outside the INTEC security fence. This evaluation will be performed as part of the CERCLA 5-year-review process as well as at specific points within the Group 4 RA schedule.

The process to develop the numerical simulation of the long-term monitoring data is summarized as follows:

1. Refine the existing conceptual model describing the physical and chemical processes that will be represented in the numerical model.
2. Refine the existing parameterization of the model that meets the conceptual model assumptions. The OU 3-13 RI/FS model parameterization will be the primary source for this initial parameterization.
3. Calibrate the model. The calibration will consist of adjusting parameter values to improve model agreement to the field data.
4. Summarize the sensitivity and uncertainty analysis and how the results will be used. The sensitivity and uncertainty analysis will evaluate the model structure to determine which attributes of the subsurface model have the largest effect on predicted peak concentrations in the aquifer.
5. Summarize the predictive model results and COC concentration predictions at the performance measurement point in 2095.

### **5.5 Composite Analysis**

As part of the CERCLA cumulative risk evaluation, the composite analysis of risks via the groundwater pathway from all sources at INTEC will be updated. As new sites are identified, additional information is obtained about existing sites and various sites are removed or capped, the WAG 3 aquifer model will be updated to account for the change in source terms. To develop an integrated strategy and schedule for updating the model, the following steps, illustrated in Figure 5-1, will be performed:

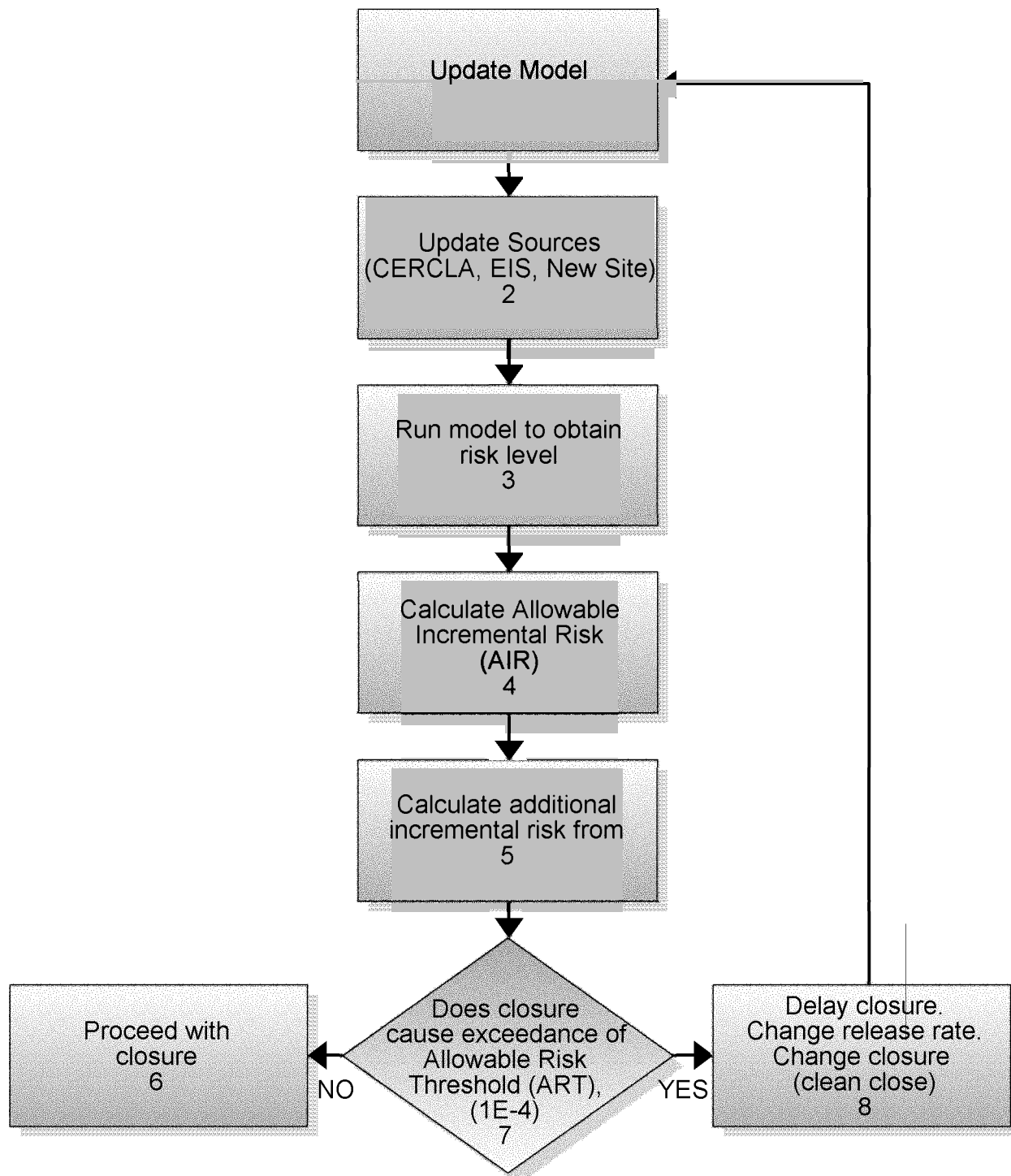


Figure 5-1. Flow chart for composite analysis.

1. Compile all WAG 3 and INTEC groundwater data collection, modeling activities, and decisions into one integrated schedule (groundwater monitoring requirements and data evaluations for other programs are outside the scope of the OU 3-13 RA)
2. Update all the pieces into one model that incorporates new data on Big Lost River, HI interbed, and Kd (Box 1 in Figure 5-1)
3. Add in all the high-level waste (HLW) sources from the EIS (DOE 1999), using the scenario selected in the HLW&FD ROD (Box 2)
4. Add in (or confirm) all CERCLA sources from OU 3-13 and OU 3-14 (Box 2)
5. Update with any newly identified sources from historical releases, as described on the New Site Inclusion Forms (Box 2).

When the composite analysis has been performed, including all known sources, the updated model can be used to determine the allowable incremental risk that can be added (Box 4). Then the impact of any given pending facility closure on the aquifer can be evaluated (Box 5). If the additional source from the closure causes a calculated exceedance of the allowable risk threshold (Box 7), then the closure plans can be modified as necessary to ensure that the RAOs for the aquifer are not exceeded in terms of either risk or MCL (Boxes 6 and 8). This RA does not have the authority to delay or redesign closures that are bound by schedules under other regulatory programs or legal agreements.

The total maximum allowable risk from groundwater ingestion resulting from sources at INTEC was set in the OU 3-13 ROD at  $1\text{E-}4$  excess cancer risks, or 1 in 10,000 by the year 2095. The second RAO is that MCLs cannot be exceeded in the aquifer after the year 2095.

### **5.5.1 Modeling**

The WAG 3 composite analysis focus is a long-term, steady-state model. The model will be run for the period from 2005 to 10,000 years. The intent of the composite analysis modeling is to support long-term decisions, such as facility disposition and closures.

The modeling focus for WAG 3 Groups 4 and 5 is initially non-steady-state modeling using calibration to new data from 2000-2095 to determine whether modeling predictions agree with empirical data. Using more current data, the Group 5 model will be used to determine whether the MCLs for the COCs are exceeded in the aquifer outside INTEC after 2095. These data-gathering and modeling efforts directly support the contingent remedial action decisions established in the OU 3-13 ROD. Information that will be gathered to update the WAG 3 model of the vadose zone and the aquifer for the composite analysis is listed and discussed below.

### **5.5.2 Hydrologic and Recharge Issues**

The Group 4 data collection will

- Determine whether drain-out of the perched water related to relocation of the percolation ponds is occurring as predicted
- Define the contribution of the Big Lost River recharge to the vadose zone
- Predict the final “steady state” of the vadose zone once the drain-out period from the percolation pond relocation is over.

The Group 5 data collection will initially focus on confirming the model predictions for the concentrations of contaminants in the HI interbed. Group 5 data collection will also support the evaluation of flux from inside INTEC security fence into Group 5.

The OU 3-14 RI will include determination of the nature and extent of the contaminated soils at the tank farm. The RI will also investigate moisture transport through the tank farms soils, and the model will be updated to incorporate this data.

### **5.5.3 Other Source Issues**

The OU 3-13 model showed that leaching and transport of contaminants from tank farm soils posed a future risk from Sr-90, Pu-238, Pu-239, Pu-240, and I-129. The risk after year 2095, based on modeling predictions, was from plutonium contamination of the tank farm soils and from I-129 trapped in the HI interbed, combined with minor I-129 contribution from surface sources, which was hydraulically driven by continuous recharge of perched water from the percolation ponds.

The OU 3-14 source update will include a source-term refinement based on tank farm field data. The tank farm soils are the major source of contaminants at INTEC. This investigation will also obtain partition coefficients ( $K_d$ s) for some contaminants in the surficial soils, which is the long-term risk driver for groundwater ingestion from the tank farm soils. The data obtained will allow for the WAG 3 model to be updated with a more accurate mass loading of contaminants from the tank farm soils.

The OU 3-14 RI will also refine the secondary source at the injection well. The OU 3-13 model showed that I-129 from the injection well would exceed the MCL after 2095. Most of this was due to “hold up” of the I-129 in the HI interbed. The Group 5 update of the HI interbed portion of the aquifer model may change this prediction.

The HLW& FD EIS model screened out plutonium as a contaminant to the aquifer from the High Level Waste Tank Heels, on the basis that plutonium would either be separated out from the waste or would be bound up in high  $K_d$  grout. Even though the grout is assumed to suffer physical breakdown at 500 years, it is also assumed to maintain its chemical properties (including the high  $K_d$  for plutonium).

Sources from any newly identified historical release sites will be added into the model during the next scheduled update to the model.

### **5.5.4 Determination of Impact of Planned Facility Closures**

To determine allowable additional incremental risk (AIR) for building closures, the source terms from building closures will be evaluated for incremental impact after all the existing sources are incorporated into the model and the model has been run to establish a baseline of risk to the aquifer.

Using  $1E-4$  risk as the allowable risk threshold (ART), add together all known sources [CERCLA Incremental Risk (CIR) + High Level Waste Incremental Risk (HLWIR) + New Site Incremental Risk (NSIR)] = total risk level (TRL) (see Figure 5-2). The allowable AIR is ART-TRL. Assume that the AIR cannot all be used by one facility. If the ART is exceeded due to the new source from what will be left in place by the closure, then either the time of the release or the rate of release must be changed until the TRL is < the ART with the new source included.

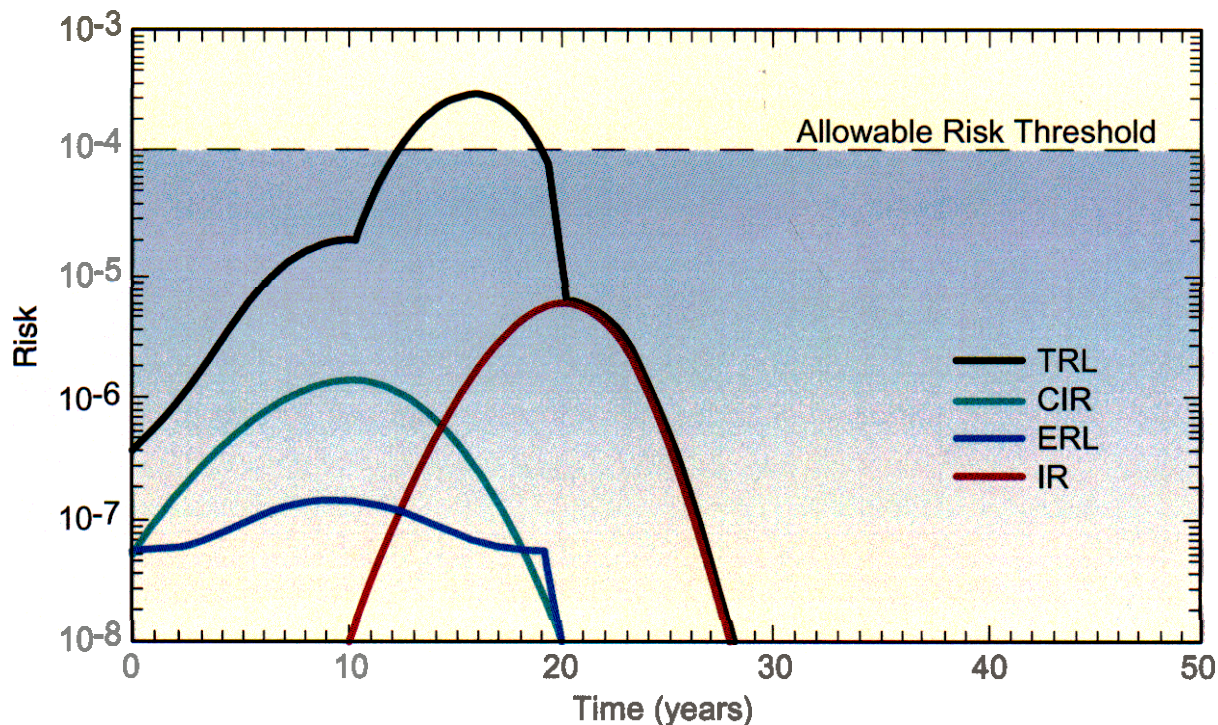


Figure 5-2. Example of the addition of all risk sources to calculate allowable incremental risk (Schafer 1998).

## 5.6 Field Oversight and Construction Management

The DOE-ID remediation project manager will be responsible for notifying the EPA and IDHW of major project activities such as project startup or closeout and other project activities deemed appropriate. DOE-ID will serve as the single interface point for all routine contact between the EPA, IDHW, BBWI, and the RD/RA contractor.

BBWI is responsible for field oversight and construction management services for this project and will provide field support for health and safety, quality assurance, and landlord services. A project organization chart and associated position descriptions are provided in the project HASP, Appendix G of this report.

Visitors to the project who wish to observe remediation activities must meet badging and training requirements necessary to enter INEEL and INTEC facilities. Project-specific training requirements for visitors are described in the project HASP.

## 5.7 Project Cost Estimate

The detailed project cost estimate is provided in Appendix E. The costs will be revised for each submittal of the work plan to reflect new information or comments.

## 5.8 Project Schedule

The RA schedule for Group 5 is presented in Appendix F and includes all project tasks from preparation of this work plan through performance of the RA and submittal of the final RA report.



Administrative and document preparation and field activities are based on an 8-hour day, 5-day work week. This schedule assumes concurrent contractor and DOE-ID document reviews. There is no schedule contingency for delays due to slow or late document reviews, or for field activities impacted by adverse weather conditions. Shown below are the future documents and major Group 5 activities identified on the schedule shown in Appendix F.

OU 3-13 Group 5 MSIP becomes final	11/30/00
Begin INTEC facility monitoring	3/9/01
Group 5 well drilling completed	8/9/02
First INTEC monitoring wells annual report	3/14/02
Statistical sampling 24-hour-pumping report	1/21/03
Final Group 5 monitoring report decision/summary report	9/18/03
Treatability studies complete (if required)	8/6/04
First composite analysis/performance assessment report	3/22/05

## 5.9 Remedial Action Reporting

Section 6 of this document identifies each of the reports to be developed and submitted in compliance with RD/RA work plan reporting requirements. Reporting requirements mandate that the following reports be prepared:

- Well completion reports
- Statistical sampling 24-hour-pumping report (if determined to be necessary)
- Monitoring report/decision summary report—a primary document
- CERCLA 5-year review(s) and composite analysis
- Routine (annual) sampling and monitoring reports
- Treatability study(ies) final report(s) (if determined to be necessary).

## 5.10 Health and Safety Plan

The project HASP was prepared specifically for the tasks and conditions expected during implementation and execution of this project. The HASP, which may be updated as site and project conditions dictate, is in Appendix G, and includes the following elements:

- Task site(s) responsibilities
- Personnel training requirements
- Occupational medical program and medical surveillance
- Safe work practices

- Site control and security
- Hazard evaluation
- Personal protective equipment
- Decontamination and radiation control
- Emergency response plan for the task(s).

## **5.11 Field Sampling Plan**

The Plume Evaluation FSP for this project, providing guidance for drilling activities, instrument installation, and collection of sampling during the OU 3-13 plume evaluation, is given as Appendix A of this document.

## **5.12 Waste Management**

The following waste streams are expected to be generated as a result of the Group 5, SRPA remedial action activities:

- Personal protective equipment
- Decontamination wastes/water
- Purge water
- Noncontaminated project waste
- Soil and debris
- Drill cuttings.

Ultimate disposition of these wastes will depend on whether they are radionuclide-contaminated. A description of these waste streams and their appropriate disposition is provided in the project Waste Management Plan, see Appendix H.

## **5.13 Quality Assurance**

Quality assurance and quality control for all phases of this project will be controlled by the Site-approved Quality Assurance Project Plan (QAPjP) for ER projects. The approved QAPjP for all ER projects at the INEEL is EPA-QA/R-5. The quality level designation and record for this project is provided in Appendix I of this document.

### **5.13.1 Quality Assurance Project Plan**

The approved QAPjP for all ER projects at the INEEL is EPA-QA/R-5. Revision 6 of the QAPjP is the latest released version. The latest revision to the ER QAPjP, provided as Appendix J in this document, is based on EPA-QA/R-5 as requested by the State of Idaho and EPA Region X.

The QA objectives for measurement will meet or surpass the minimum requirements for data quality indicators established in the “Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10 and Inactive Sites” (DOE-ID 2000b). The QAPJP provides minimum requirements for the following measurement quality indicators: precision, accuracy, representativeness, completeness, and comparability.

The detection limits described in DOE-ID 2000b meet or surpass the decision-based concentrations of the contaminants of concern with the exception of I-129. The I-129 quantitation requirements (reporting threshold) is 1 pCi/L, which necessitates a minimum detection limit (MDL) of 0.1 pCi/L to identify I-129 presence with an acceptance level of confidence. The 0.1 pCi/L MDL can be met using mass spectrometry coupled with a specialized sample introduction system to increase sensitivity (which also serves to lower detection limits). High resolution inductively coupled plasma – mass spectrometry can also meet the 0.1 pCi/L MDL. This capability is being developed in the Analytical Laboratory Department at INTEC, which would allow measurement of environmental samples directly without chemical separation. The minimum detection limits for Sr-90 and H-3 need to be at least 0.8 pCi/L and 2,000 pCi/L, respectively.

## **5.14 Decontamination**

Upon completion of well drilling activities, exposed surfaces of equipment used for well drilling and sampling will be decontaminated at designated decontamination areas in each work zone by brushing and wiping until all visible traces of soil and soil-related staining have been removed. If simple brushing and wiping cannot remove all the soil/staining, decontamination solutions (e.g., water) will be used. All rags, brushes, and spent decontamination solutions will be managed per the project Waste Management Plan (see Appendix H).

## **5.15 Long-Term Monitoring**

The project LTMP (Appendix B) identifies routine and/or periodic monitoring, sampling/analysis, inspection, and maintenance requirements to be implemented following the completion of Group 5 well drilling, 24-hour-pump tests, and treatability study activities. The plan also identifies the requirements for periodic reporting and identification of end-points for long-term. Maintenance activities are expected to continue until the end of FY 2095. The LTMP may be revised as necessary to incorporate changes and additions identified during the implementation of the plan.

## **5.16 Spill Prevention/Response Program**

Any inadvertent spill or release of potentially hazardous materials (i.e., equipment fluids) will be subject to the substantive requirements contained in the INEEL “Emergency Preparedness—Addendum 2, Idaho Chemical Processing Plan” (PLN-114-2).

Handling of the material and/or substance shall be in accordance with the recommendations of the applicable material safety data sheets, which will be located at the project site(s). In the event of a spill, the emergency response plan outlined in the project HASP will be activated. All materials/substances at the work site shall be stored in accordance with applicable regulations in approved containers.

## **5.17 Other Procedures Relevant to RA Activities**

Appendix L identifies additional documents that are relevant to RA activities at the INTEC.

## **5.18 Storm Water Pollution Prevention Plan**

The INEEL must comply with the National Pollutant Discharge Elimination System (40 CFR 122), General Permit for *Storm Water Discharges from Construction Activities*, issued February 17, 1998, by EPA. The General Permit requires a storm water pollution prevention plan for construction activities. The INEEL generic plan and the project-specific plan are provided in Appendix M.

## **6. REPORTING**

Compliance with Group 5 requirements will necessitate the development of several reports for this project. A brief discussion of each is provided below.

### **6.1 Well Completion Reports**

This report, prepared following drilling activities, will include construction diagrams and detail the construction and completion of each well drilled.

### **6.2 Twenty-Four-Hour Pump Test and Sampling Report**

This report will document the results of the 24-hour pump tests that are required on wells when initial sampling activities indicate that COCs concentrations exceed action levels. This report will be prepared only if 24-hour pumping tests are determined necessary.

### **6.3 Monitoring Report/Decision Summary**

This report, a primary document, will be produced following the drilling of the new wells, their sampling and analysis, and 24-hour pump tests if required. The report will include the 24-hour pump test and sampling report and document the results of well monitoring/sampling activities and provide the justification for the decision concerning the need for treatability studies and contingent remedial action. An updated operations and maintenance plan will be included as a part of this report. This report will function as the remedial action report for Group 5 activities.

### **6.4 CERCLA Five-Year Review(s)**

Section XXII-22.1 of the FFA/CO states that “consistent with Section 121(c) of CERCLA, 42 U.S.C. 9621(c), and in accordance with this Agreement, U.S. DOE agrees that EPA may review response action(s) for OUs that allow hazardous substances to remain on-site, no less often than every five (5) years after the initiation of the final response action for such OU to assure that human health and the environment are being protected by the response action being implemented” (DOE-ID 1991). DOE-ID 1994, Section 3.3.6, states: “The 5-year review process involves an evaluation as to whether the selected remedy remains ‘protective,’ in light of possible new standards, DOE-ID will evaluate, on a case-by-case basis, significant new requirements to ensure that the selected remedy does in-fact remain protective.” Compliance with this review will require the development of a report providing information regarding the status of the response action and the need for additional action or work.

### **6.5 Routine Sampling and Monitoring Reports**

The data developed from the routine (annual) sampling of the 11 wells monitoring the flux of contaminants out of INTEC, three wells monitoring contaminants below the HI interbed, and six plume monitoring wells will be used to produce a yearly report.

### **6.6 Treatability Study(ies) Final Report**

Treatability studies will be conducted on wells that have a zone or zones projected to exceed MCLs in 2095 and where pump tests demonstrate that water production equal to or greater than 0.5 gpm for a 24-hour period is possible. Reports will be prepared to document the results of the tests performed. This report(s) will be prepared only if treatability studies are determined necessary.

## 7. REFERENCES

- 10 CFR 20, Appendix B, 1975, "Concentrations in Air and Water Above Natural Background," *Code of Federal Regulations*, Office of the Federal Register, October 1975.
- 40 CFR 61.92, 1989, "Standard," *Code of Federal Regulations*, Office of the Federal Register, December 1989.
- 40 CFR 61.93, 1989, "Emission Monitoring and Test Procedures," *Code of Federal Regulations*, Office of the Federal Register, December 1989.
- 40 CFR 122, 2001, "EPA Administered Permit Programs: The National Pollutant Discharge Elimination System," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 122.26, 2001, "Storm Water Discharges," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 125, 2001, "Criteria and Standards for the National Pollutant Discharge Elimination System," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 141, 2001, "National Primary Drinking Water Regulations," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 262.11, 2001, "Hazardous Waste Determination," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 264.601, 2001, "Environmental Performance Standards," *Code of Federal Regulations*, Office of the Federal Register, July 2001.
- 40 CFR 300.430(e)(2)(1), 1990, "Feasibility Study," *Code of Federal Regulations*, Office of the Federal Register, March 1990.
- Anderson, S. R. and B. D. Lewis, 1991, *Stratigraphy of the Unsaturated Zone at the Radioactive Waste Management Complex, Idaho National Engineering Laboratory, Idaho*, USGS Water-Resource Report 89-4065 (IDO-22080).
- DOE, 1999, *Idaho High-Level Waste & Facilities Disposition Draft Environmental Impact Statement*, DOE/EIS-0287D, December 1999.
- DOE Order 435.1, 1999, "Radioactive Waste Management," U.S. Department of Energy, July 9, 1999.
- DOE Order 5400.5, Change 2, 1993, "Radiation Protection of the Public and the Environment," U.S. Department of Energy, January 7, 1993.
- DOE-ID, 1991, *Federal Facility Agreement and Consent Order Action Plan*, U.S. Department of Energy Idaho Field Office, U.S. Environmental Protection Agency Region 10, State of Idaho Department of Health and Welfare.
- DOE-ID, 1993, *Remedial Design and Remedial Action Guidance for the Idaho National Engineering Laboratory*, DOE/ID-12584-152, U.S. Department of Energy Idaho Operations Office.

- DOE-ID, 1994, *Remedial Design and Remedial Action Guidance for the Idaho National Engineering Laboratory*, DOE/ID-12584-152, U.S. Department of Energy Idaho Operations Office, Rev. 2, September.
- DOE-ID, 1997a, *Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL – Part A, RI/BRA Report (Final)*, DOE/ID-10534, U.S. Department of Energy Idaho Operations Office, November 1997.
- DOE-ID, 1997b, *Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL – Part B, FS Report (Final)*, DOE/ID-10572, U.S. Department of Energy Idaho Operations Office, November 1997.
- DOE-ID, 1998, *Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL, Part B, FS Supplement Report, Volumes 1 and 2*, DOE/ID-10619, Rev. 2, U.S. Department of Energy Idaho Operations Office, October 1998.
- DOE-ID, 1999, *Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13, Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho*, DOE/ID-10660, Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1998.
- DOE-ID, 2000a, *Remedial Design/Remedial; Action Scope of Work for Waste Area Group 3, Operable Unit 3-13*, DOE/ID-10721, U.S. Department of Energy Idaho Operations Office, Rev. I, February 2000.
- DOE-ID, 2000b, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites*, DOE/ID-10587, U.S. Department of Energy Idaho Operations Office, Rev. 7, September 2000.
- EPA, 1990, *Guidance on Expediting Remedial Design and Remedial Action*, EPA/540/G-90/006, August 1990.
- EPA, 1994a, “Guidance for the Data Quality Objective Process,” EPA/600/R-96/055, EPA QA/G-4, September 1994.
- EPA, 1994b, *Estimating Radiogenic Cancer Risk*, U.S. Environmental Protection Agency, EPA-402-R93-076.
- Frederick, D. B and G. S. Johnson, 1996, *Estimation of Hydraulic Properties and Development of a Layered Conceptual Model for the Snake River Plain Aquifer at the Idaho National Engineering Laboratory, Idaho*, State of Idaho INEL Oversight Program, Idaho Water Resources Research Institute.
- IDAPA 16.01.011.200 change to 58.01.011.200, 1997, “Groundwater Quality Standards,” *Idaho Administrative Code*, Office of Administrative Rules, March 20, 1997.
- IDAPA 37.03.09.025, 1993, “Construction of Cold Water Wells,” *Idaho Administrative Code*, Office of Administrative Rules, July 1, 1993.
- IDAPA 58.01.01.585, 1995, “Toxic Air Pollutants Noncarcinogenic Increments,” *Idaho Administrative Code*, Office of Administrative Rules, June 30, 1995.

- IDAPA 58.01.01.650, 1994, “Rules for Control of Fugitive Dust,” *Idaho Administrative Code*, Office of Administrative Rules, May 1, 1994.
- IDAPA 58.01.02.400, 1993, “Rules Governing Point Source Discharges,” *Idaho Administrative Code*, Office of Administrative Rules, July 1, 1993.
- IDAPA 58.01.02.401, 1993, “Point Source Wastewater Treatment Requirements,” *Idaho Administrative Code*, Office of Administrative Rules, July 1, 1993.
- IDAPA 58.01.05.006, 2000, “Standards Applicable to Generators of Hazardous Waste,” *Idaho Administrative Code*, Office of Administrative Rules, April 5, 2000.
- IDAPA 58.01.05.008, 2000, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities,” *Idaho Administrative Code*, Office of Administrative Rules, April 5, 2000.
- IDAPA 58.01.11.200(a), 1997, “Groundwater Quality Standards,” *Idaho Administrative Code*, Office of Administrative Rules, March 20, 1997.
- IDAPA 58.01.17.300, 1988, “Permit Requirements and Application,” *Idaho Administrative Code*, Office of Administrative Rules, April 1, 1988.
- McCarthy, J.M., R. C. Arnett, R. M. Neupauer, M. J. Rohe, and C. Smith, 1994, *Technical Memorandum Development of a Regional Groundwater Flow Model for the Area of the Idaho National Engineering Laboratory, Eastern Snake River Plain Aquifer*, EG&G Idaho Inc., Idaho Falls, ID.
- NEA, 1997, *Radiation in Perspective-Applications, Risks, and Protection*, Nuclear Energy Agency, Organization for Economic Cooperation and Development.
- PLN-114-2, 2001, “Emergency Preparedness—Addendum 2, Idaho Chemical Processing Plan,” Rev. 80, Emergency Preparedness Department, Idaho National Engineering and Environmental Laboratory, August 2001.
- Schafer, Annette L., 1998, *Proposed Approach for Assessing the Groundwater Risk Following Facility Closure at the Idaho Chemical Processing Plant*, INEEL/EXT-98-00207, February 1998.
- UNEP, 1985, *Radiation-Doses, Effects, and Risks*, United Nations Environmental Program.



**Appendix A**

**Plume Evaluation Field Sampling Plan for Operable Unit 3-13,  
Group 5, Snake River Plain Aquifer**

**DOE/ID-10784**  
**Revision 2**

[The document that is the subject of this appendix was provided as an attachment to the original deliverable.]

To view this Appendix, please see specific  
“Stand Alone” document number

**Appendix B**

**Long-Term Monitoring Plan for Operable Unit 3-13,  
Group 5, Snake River Plain Aquifer**

**DOE/ID-10783**  
**Revision 2**

[The document that is the subject of this appendix was provided as an attachment to the original deliverable.]

## **APPENDIX B**

**DOE/ID-10783 IS ERRONEOUSLY LISTED AS  
REVISION 2 (REV.02) - REVISION 1 (REV.01)  
IS THE CORRECT REVISION NUMBER**